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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/697,002      | 10/31/2003  | Kiwamu Tanahashi     | NIT-401             | 9915             |

7590 05/18/2005

Mattingly, Stanger & Malur, P.C.  
Suite 370  
1800 Diagonal Road  
Alexandria, VA 22314

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| EXAMINER |
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RICKMAN, HOLLY C

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 1773     |              |

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/697,002

Applicant(s)

TANAHASHI ET AL.

Examiner

Holly Rickman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-16 is/are pending in the application.
- 4a) Of the above claim(s) 13-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 13-16 are withdrawn as being directed to a non-elected invention.

### ***Claim Objections***

2. The objection to claim 7 is withdrawn.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a NiFe layer or a layer having a fcc structure, does not reasonably provide enablement for a metal layer, broadly, which has an fcc structure. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

5. The rejections of claims 8-9 and 11 under 35 U.S.C. 112, second paragraph, are withdrawn in view of Applicant's amendments.

***Claim Rejections - 35 USC § 102***

6. The rejection of claims 1-2, 4-6, and 8-10 under 35 U.S.C. 102(e) as being anticipated by Carey et al. (US 2003/0022023) is withdrawn in view of Applicant's amendments.

***Claim Rejections - 35 USC § 102/103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The rejection of claim 7 under 35 U.S.C. 102(e) as being anticipated by, or in the alternative, under 35 USC 103(a) as being unpatentable over Carey et al. (US 2003/0022023) is withdrawn in view of Applicant's amendments.

***Claim Rejections - 35 USC § 103***

9. Claims 1 and 3-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Carey et al. (US 2003/0022023) in view of Shukh et al. (US 6818330).

Carey et al. disclose a magnetic recording medium for use with a single-pole recording head having a multiple soft magnetic layers separated by non-magnetic coupling layers such that the soft magnetic layers are antiferromagnetically coupled. The reference teaches that an antiferromagnetic biasing layer is deposited between the lowermost soft magnetic layer and the substrate and a perpendicular magnetic layer is deposited on top of the soft magnetic multi-layered stack. Carey et al. teach that several different amorphous soft magnetic materials

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including CoZrNb can be used for the soft magnetic layers. It is the Examiner's contention that the group of disclosed materials suitable for forming the soft magnetic layers is small enough that one of ordinary skill in the art would immediately envisage an embodiment of the invention having one of the disclosed amorphous alloys. See Fig. 1, 2, 3A; paragraphs 2, 12, 14, 16, 18, 20, 24, 27. The reference also teaches the use of ferromagnetic layers separating each soft magnetic layer from the non-magnetic layer therebetween.

With respect to the newly added limitation directed to a ferromagnetic layer that is formed directly under the first amorphous soft magnetic layer, Carey et al. teaches that either a ferromagnetic layer or an antiferromagnetic layer can be used beneath the first soft magnetic layer to serve as a biasing layer. However, the reference fails to teach the use of both layers beneath the first soft magnetic layer.

Shukh et al. teaches that it was known in the art at the time of invention that an antiferromagnetic or ferromagnetic film can be used for biasing in the manner described above (see col. 2, lines 20-47). The reference also teaches that a ferromagnetic biasing film and an anti-ferromagnetic biasing film each have their own set of advantages and disadvantages.

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to form a composite layer of both an antiferromagnetic biasing layer and a ferromagnetic biasing layer underneath the first amorphous soft magnetic layer taught by Carey et al. in order to obtain the advantages associated with each of the biasing materials.

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10. The rejection of claim 3 under 35 U.S.C. 103(a) as being unpatentable over Carey et al. (US 2003/0022023) in view of Girt et al. (US 6645614) is withdrawn. The claim has been rejected in view of Carey et al. as applied above.

***Allowable Subject Matter***

11. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The closest prior art to Carey et al. fails to teach or suggest the claimed combination of an antiferromagnetic layer underlying an antiferromagnetically coupled soft magnetic underlayer having an underlying bcc alloy layer containing Co and Fe.

***Response to Arguments***

12. Applicant's arguments filed 3/7/05 have been considered but are moot in view of the new ground(s) of rejection.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after


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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Holly Rickman  
Primary Examiner  
Art Unit 1773

May 13, 2005